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ABSTRACT

A study reanalyzed the 1977 original form of the Self-Directed Learning Readiness Scale (SDLRS) developed by Guglielmino. It questioned whether there is an intracultural and intercultural factorial consistency, whether raters would reconfirm the eight-factor solution, and whether raters would reconfirm the main characteristics of a "highly self-directed learner." To answer the first question, the 41 items of the SDLRS were translated into German and administered to a German sample (n=460). Simultaneously, the original instrument was completed by a U.S. sample (n=226). The Guglielmino sample consisted of 307 respondents. The second question was answered by 10 persons trained in empirical research methods, and the third by 20 adult education practitioners. Findings indicated that the factor solutions were not stable, even for the U.S. sample. Twenty-one of the 41 of the factor solution for the U.S. sample were multistructured. Only 2 of 41 items were structurally loading on corresponding factors over all samples. Ten raters were asked to assign the 41 items of the original instrument to Guglielmino's 8 factors. Eleven items were assigned to the same original eight factors. Results indicated the raters had problems in revalidating the original factor structure. Twenty adult education practitioners were asked to assign the 41 items to 14 characteristics. Eleven or more of them distinctly assigned six items to one characteristic. (Contains 14 references and 5 data analysis tables.) (YLB)

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THE 10TH INTERNATIONAL SELF-DIRECTED
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WEST PALM BEACH, FLORIDA

THE ORIGINAL SELF-DIRECTED READINESS SCALE RECONSIDERED

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THE ORIGINAL SELF-DIRECTED READINESS SCALE RECONSIDERED[1]

Gerald A. Straka and Ingo M. Hinz

ATTEMPTS TO MEASURE SELF-DIRECTION IN LEARNING

Self-directed learning is a central theme in theory and practice in adult education in the United States of America. As a consequence considerable empirical research efforts have been undertaken to investigate this phenomenon. Concerning the quantitative approach, the Oddi Continuing Learning Inventory[2] (OCLI; Oddi, 1984) and the Self-Directed Learning Readiness Scale (SDLRS; Guglielmino, 1977), are the two instruments which "have played a major role in making self-direction one of the most extensively researched areas in adult education during the decade of the 1980s" (Brockett & Hiemstra, 1991, p. 56).

For the SDLRS some of the author's information about its application and quality of measurement are: "In 1977, Dr. Lucy M. Guglielmino developed, field-tested, and revised the Self-Directed Learning Readiness Scale. It has since been translated into French, Spanish, Japanese, Chinese, Finnish and Italian and used in over 150 research efforts, including more than 50 master's theses and doctoral dissertations. The SDLRS is cited in numerous articles and books relating to adult education and training and is generally recognized as the most valid and widely-used instrument of its kind" (Guglielmino & Guglielmino, 1991, p. 27[3]).

In Guglielmino's (1977) dissertation, in which the conceptual basis for this instrument was established, the instrument consists of 41 items. Principal component factor analysis with varimax rotation yielded 13-, 8-, 5- and 2-factor solutions, "but the

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[1] This contribution is a partial result of the DFG-project STR 266/7-1.

[2] Concerning the intercultural factorial stability of the OCLI see Straka (1996).

[3] In the meantime the SDLRS is also used in Korea (Cheong, Cheong & Long, 1995).

eight-factor solution was chosen, since it provided the most meaningful and interpretable solution" (Guglielmino, 1977, p. 60). According to Guglielmino's interpretation these factors, with items loadings > .30 are:

(1) Openness to learning opportunities (8[4], 1, all reverse items)
(2) Self-concept as an effective learner (6, 3)
(3) Initiative and independence in learning (8, 1)
(4) Informed acceptance of responsability for one's own learning (6, 4)
(5) Love of learning (3, 3)
(6) Creativity (3, 4)
(7) Positive orientation to the future (3, 2)
(8) Ability to use basic study skills and problem-solving skills (2, 2).

The field tested 41-items version was transformed in the 58-items form by eliminating 9 and adding 26 new items. For the current version, there is no further publication of the Guglielminos themselves, concerning the reconfirmation of the 1977 eight-factor solution. However, they resume, "examination of the literature reveals a large number of findings that provide evidence that the SDLRS does indeed measure the construct it was designed to measure. Overall, the validity studies show a definite positive relationship between SDLRS scores and observable indicators of self-directed learning" (Guglielmino & Guglielmino, 1991, p. 27[5]).

REANALYSES OF THE SDLRS (58-ITEMS FORM)

Mourad & Torrance (1979), Field (1989) and West & Bentley (1990) are the three studies which empirically and explicitly analysed the structure and validity of the 58-items version. Field's investigation concludes, the current SDLRS "... is not

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[4] "Items which loaded on the factor under discussion but loaded more strongly on a different factor are listed in the table under a dividing line. These items were not considered in the naming of the factor, but were considered after the naming for possible confirmation..." (Guglielmino 1977, pp. 60-61). Therefore the number of the items used for naming the factors are listed in brackets first followed by the number of items loading more strongly on a different factor.

[5] Examples for these observable indicators are: number of learning projects conducted, hours spent in self-planned study, observer ratings of behaviours indicating self-directed learning.

closely linked with readiness for self-directed learning [and the] ... SDLRS is not a valid measure of readiness for self-directed learning" (Field, 1989, p. 138). However, he interpretates only the first four factors and does not publish the items assigned to each of these factors[6]. The other two studies are concluding that there is some support for the validity of the instrument by recommending modifications and additional studies as well. Bonham's (1991) methodological considerations are raising the question if the SDLRS is representing "a positive attitude toward learning in general" (Bonham, 1991, p. 92). She is recommending further validation studies.

Noticing that there was neither an official German SDLRS form nor an official use of this instrument in Germany the idea was to test its cross-cultural consistency on a German sample and to compare the results with those of Mourad & Torrance (1979) and West & Bentley (1990).

A reanalysis of the factorial consistency of the 58-items instrument with classical factor analysis (principal components & varimax rotation) found out that Mourad & Torrance (1979) and Straka (1995, in print) explain nearly the same amount of variance (39% and 42%)[7] and there is a commonness of nearly three quarters of the items (71% i.e. 41 items) assigned to the eight factors. However, if the criterion of single structure is considered, the cross-cultural commonness is reduced to nearly one third of the items (i.e. 18 items).

LISREL analyses indicated for the eight-factor orthogonal model of Straka (1995, in print) and Mourad & Torrance (1979) that each model tested delivers a better fit compared with West & Bentley (Straka, 1995, in print).

In the meantime the authors got access to Landers (1989)[8] data. Using this data it was possible to evaluate the intra-cultural consistency of the 58-items form as well. An exploratory factor analysis[9] - exploratory because of the small sample size (n = 98) - with principal components analysis and varimax rotation (52%

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[6] Field's reply to the author's request for the data or his factor solutions with the assigned items was: "...unfortunately, I have not retained any of the data from my investigations" (FAX, 5/24/94).

[7] Guglielmino did not publish the amount of explained variance.

[8] We thank Dr. Landers for the generosity in offering the access to his data.

[9] It was not possible to compute a confirmatory factor alalysis with LISREL because the sample size was to small.

explained variance) was computed in order to compare the solution with the eight factor solutions of Straka (1995, in print) and Mourad & Torrance[10] (1979) (see appendix 1).
The results show that a great number of items are loading on corresponding factors. However it should be mentioned that these comparisons are based on items with multi-structure. Considering the criterion of single-structure the structural commonness between the three samples is considerably reduced. The following items are loading on corresponding factors:

Mourad & Torrance in comparison with Straka: (17 items)
1, 17, 45, 46
6, 7, 12, 19
10, 11, 33
15, 50
16, 21
34, 36

Straka in comparison with Landers: (3 items)
1, 17, 32

Mourad & Torrance in comparison with Landers: (6 Items)
3, 20, 29, 48
1, 17.

These results were surprising. Only the combination of two items (1, 17) is stable over all three samples. The degree of structural commonness in the inter-cultural comparison is higher than that for the intra-cultural comparison.

REANALYSES OF THE SDLRS (41-ITEMS FORM)

[10] It should be noted that the three samples seem to be different: Mourad & Torrance's sample included grades 5 through 12 from twelve different states participating the University of Georgia Program on Gifted / Talented Education. Landers'sample consisted of adult professional students in the educational development, counseling and administrative studies division in the Syracuse University School of Education, mostly aged 30 to 49 years (71%). In Straka's sample included mostly regular students from different departments of Bremen University.

In the US-American scientific discussion about the SDLRS the 1977 eight-factor solution is generally recorded even after Field's fundamental critique (e.g. Brockett & Hiemstra, 1991). However, there is no reanalysis of the consistency of this factor solution derived from the original 41 items. Therefore we decided to go back to the roots and reanalyse the 1977 original 41-items form with the following questions:

a) Is there an intra-cultural and inter-cultural factorial consistency of the 1977 instrument?

b) Do raters reconfirm the eight-factor solution for the 1977 instrument?

c) Do raters reconfirm the main characteristics of a "highly self-directed learner" (Guglielmino, 1977, p. 73) based on the 1977-instrument?

To get an answer to question a) the 41 items were translated into German and administered to a German sample. Simultaneously the original instrument was filled out by an US-American sample. Question b) was answered by 10 persons trained in empirical research methods and question c) was answered by 20 practicians in adult education.

DESCRIPTION OF THE SAMPLES

US-Sample

226 persons completed and returned the original 41-instrument[11], 46% of them are from Colorado, 38% from Tennessee, 12% from Illinois, and 4% from Georgia. 63 % are female, 37 % male, 34% less than 25 years of age, 31% between 25 to 34, 18% between 35 to 44 and 17% 45 years and older. 87% are white, 8% black, 3% hispanic and 2% are asian. At the time of completing the instrument, 9% were college juniors, 25% undergraduates, 52% graduates and 14% doctoral candidates.

German Sample[12]

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[11] Our thanks are due to Rosemary Caffarella, Bradley Courtenay, Carol Kasworm and Ingrid Wojciechowski for their support in creating the US-sample.

[12] The instrument was independently translated into German by two persons. Differences in translation were checked and harmonized. However, there was no retranslation from German to

460 persons completed and returned the instrument. They were students of Bremen University from different faculties and departments (economy, psychology, teacher and adult education, law, senior students). 38% are male and 62% female; 37% are 24 years and younger, 48% between 25 to 34 years, 10% 35 to 44 years and 5% 45 years and older. 41% were up to their 4th term, 56% studies in their 5th to 10th and 3% in their 11th and further term. 18% of the questionnaired persons possess job experience.

Guglielmino Sample

The Gugliemino (1977, 42pp.) sample consisted of 307 respondents. 95 of them were high school juniors and seniors in public schools in Georgia and Canada; 180 were college undergraduates in 12 different daytime (49) and evening classes (131) ranging from educational psychology, chemistry, accounting, literature, history, mathematics, political science, psychology, and sociology; 32 adults attended noncredit continuing education courses.

A) RESULTS OF THE FACTOR ANALYSES

According to Guglielmino (1977) principal component factor analysis with varimax rotation was used. Using the Kaiser-criterion 12 factors emerged from the US-sample and the German sample as well compared with 13 factors in Guglielmino's (1977) dissertation. Like Guglielmino (1977) the criterion eight factors was choosen next. These eight factors explain 48% of the variance in the US- and 44 % in the German sample[13]. The results of the eight-factor solution for the three samples are recorded in appendix 2.

The use of terms like "scale" or that the instrument "does indeed measure the construct it was designed to measure" (Guglielmino & Guglielmino, 1991, p. 27) may indicate that the SDLRS claims to be a psychometric scale. If this criterion is considered, only single-structure items are to be included.

US-English by a native speaker. This should be realized by comparing these results with those of the other studies.

[13] Guglielmino did not publish the explained variance of her eight-factor-solution.

Under this condition the 8-factor solutions consist for the US-sample of 20, for the Guglielmino sample of 22 and for the German sample of 28 items with single structure.
Analysing the results for the US- compared with Guglielmino 1977-factor solution the structural commonness is reduced to four items (17, 33, 35, 36). The same comparison between the solutions of Guglielmino 1977 and of the German sample reveal a structural commonness of two items (33, 35). Finally the comparison of the factor solutions for the US- and the German sample yields a structural commonness of nine items. In this case, items 30, 31 and 41 (both factor I); items 28 and 34 (US-sample: factor VII); German sample: factor II); items 33 and 35 (US-sample: factor III; German sample: factor V); and items 36 and 39 (US-sample: factor IV; German sample: factor III) are loading on corresponding factors.
A comparison across all three solutions reveals a structural commonness for the items 33 and 35; i. e. two, out of 41 items are loading on corresponding factors over the three samples.
A consequence of these results might be some caution using the original instrument for intra- and intercultural comparisons. Concerning the structural commonness of the factor solutions for the US- and the German samples of the early ninetees the hypotheses might be a shift in personal meaning and/or importance of some items over time.

B) RATER-REEVALUATION OF THE FACTOR SOLUTION

Ten raters were asked to assign the 41 items of the original instrument to Guglielmino's (1977) eight factors. These persons were students trained in empirical research methods who had choosen a class about self-direction in adult learning. The main concepts of self-directed learning in adult education were introduced, compared and analysed. Guglielmino's (1977) study was not introduced before the rating took place.
The results of the semi-expert's reevaluation (see appendix 3) were analysed in the following way: If there was one distinct modus the item was assigned to the corresponding factor. In the other case the item was excluded from further analysis.

According to this criterion five items were excluded from further considerations; these are the items 2, 8, 20, 28, 38. Furthermore, it should be noted that items 5 and 25 were not assigned to one of the eight factors by Guglielmino (1977) herself. For the remaining 34 items the raters assigned eleven items to the same factors of the 1977-Guglielmino solution. These are the following items: 1, 6, 16, 19, 22, 23, 24, 27, 31, 35, 36 or less than a third of the SDLRS.
The result indicated that the raters had problems in revalidating the original factor structure[14].
Therefore another sample of raters were asked to reevaluate Guglielmino's definition of a highly self-directed learner which represents the central constructs used to generate the 41-items-instrument.

C) EXPERT REEVALUATION OF A "HIGHLY SELF - DIRECTED LEARNER"

On the basis of the 14 highest rated characteristics [indicated with figures] in the Delphi-survey Guglielmino tentatively describes a highly self-directed learner as someone who "... exhibits initiative, independence, and persistence in learning; one who accepts responsability for his or her own learning and views problems as challenges, not obstacles; one who is capable of self-discipline and has a high degree of curiosity; one who has a strong desire to learn or change and is self-confident; one who is able to use basic study skills, organize his or her time and set an appropriate pace for learning, and to develop a plan for completing work; one who enjoys learning and has a tendency to be goal-oriented" (Guglielmino, 1977, p. 73).
Assuming that these are the characteristics for which the attempt was made to represent them with more than one item (Guglielmino, 1977), 20 practicians in adult education were asked to assign the 41 items to one of these 14 characteristics[15].

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[14] However, it should be considered that the revalidation was realised by persons of German origin on the basis of the 41 items translated into German. Therefore a similar procedure is recommended with native experts and the original items.
[15] Compare footnote 12.

According to the ratings of the practicians (comp. appendix 4) none of the 41 items was assigned to characteristic three "persistence in learning". Item 15 and 35 are not related to any of the 14 chracteristics. These two items might represent some or one of the 19 other characteristics judged "... the most closely related to ... self directed learning behavior" (Guglielmino, 1977, p. 93). For nine items (7, 9, 18, 21, 22, 23, 26, 28, 31) the modus is realized with a frequency of four or five, i.e. 15 or less raters assigned these items to other or none of the fourtheen concepts. For six items (4, 10, 11, 25, 32, 38) the modus is 11 or more. For the remaining items the modus frequency is between six and nine. These results confirm the notion that "one item often involved more than one characteristic" (Guglielmino, 1977, p. 38).

D) LISREL MODEL FITS

Neither the 'classical' factor analysis nor the reevaluations of the raters were able to reproduce the structure of the original eight factor solution. The question remains which of these different solutions represents the closest fit to the data. Therefore LISREL (Jöreskog & Sörbom, 1993) analyses were run. The results are listed in appendix 5.

All LISREL procedures based on correlation matrices. Every model was tested in two ways: orthogonal and oblimin.

The orthogonal solution complies the requirement of a psychometric scale that each item is associated to one distinct construct. The low number of items with single structure quality recommended to test the oblimin solution as well.

Model 1 consists of all the items with single structure of Guglielmino's (1977) eight-factor solution. Model 2 represents Guglielmino's (1977) multi structure solution. Model 3 is the result of the raters reevaluation of the eight-factor solution (comp. appendix 3).

Each model was used for the German and the US-sample as well. Five procedures had no solution, which indicates that these models include too many specification errors, so that they were inappropriate to explain the data at all.

The chi-square value-degree of freedoms-ratio range from 2.2 to 3.5 indicating that the models were underspecified. The probability of the chi-square values is very small; this means that by rejecting the model the probability of rejecting a "true" model is very small (Backhaus et al., 1994).
Model 1 realizes the best fit. However, this fit could only be computed for the US-sample. Furthermore, the GFIs range from .73 to .87, the AGFIs range from .68 to .82, and RMR from .066 to .087. These results indicate that all the models realize nearly the same fit by tendency.

CONCLUSION AND COMMENTS

The factor solutions are not stable, even not for the US-culture. 21 items out of 41 of the factor solution for the US-sample are multi-structured. Only 2 out of 41 items are structurally loading on corresponding factors over all samples. 11 items were assigned to the same original eight factors of Guglielmino (1977) by students of empirical research methods. 11 or more of the 20 practitioners in adult education distinctly assigned 6 out of 41 items to one of 14 of the 33 characteristics of a "highly self-directed learner" (Guglielmino, 1977, p. 93). (These 33 characteristics were rated from desirable to essential by experts in the field of self-directed learning who participated in Guglielmino's (1977) Delphi study). Regarding these results the following questions might be raised:

1. Does a factor analysis can realize a solution with distinct meanings?
2. What is the meaning of a sumscore based on 41 items, representing 33 characteristics of a highly self-directed learner, where some of the items are intentionally and partially empirically related to more than one "characteristic" or factor?
3. Does the SDLRS realizes the quality of a psychometrical scale?

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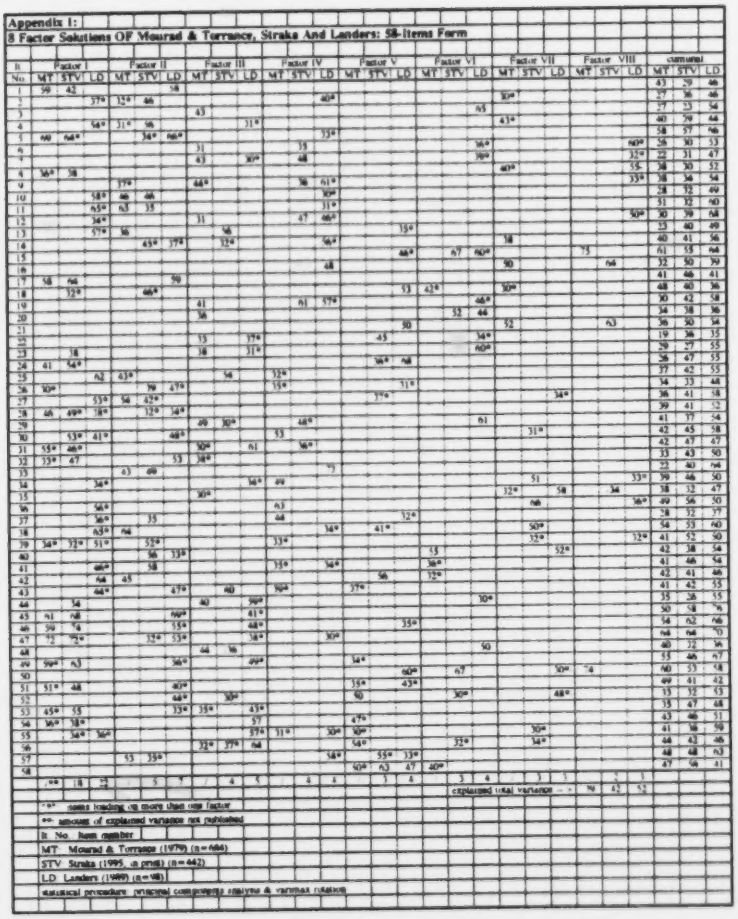
Appendix I:

8 Factor Solutions OF Mourad & Torrance, Straka And Landers: 58-Items Form



It. No.	Factor I			Factor II			Factor III			Factor IV			Factor V			Factor VI			Factor VII			Factor VIII			summated		
	MT	STV	LD	MT	STV	LD	MT	STV	LD	MT	STV	LD	MT	STV	LD	MT	STV	LD	MT	STV	LD	MT	STV	LD	MT	STV	LD
1	59	42				58																			63	29	46
2			37*	12*	46							40*							30*						27	36	46
3							63											65							77	33	54
4			56*	31*	56				31*										47*						60	79	44
5	69	64*			34*	66*						33*													58	57	66
6							31			35								56*						62*	56	30	53
7							63		30*	48								39*						32*	22	31	47
8	36*	38																	40*						55	38	30	52
9				37*			64*			38	61*														33*	58	34	54
10			58*	48	48						30*															28	32	49
11			65*	63	35						31*															51	32	40
12			34*				31			47	66*														50*	30	39	68
13			57*	36				36					35*													25	40	49
14					45*	37*		32*			56*															40	41	56
15													48*			67	60*		18							61	15	64
16											48								30			75				32	30	39
17	58	66				59																	66			41	46	41
18		32*			66*								53	42*					30*							48	40	36
19							41			61	57*							68*								30	42	58
20							36									52	44									34	58	36
21													50						52				63			36	30	34
22							15		35*					45*				34*								19	36	35
23		18					18		31*									60*								29	27	55
24	41	54*												36*	48											26	47	55
25			62	63*				56		33*																37	62	55
26	30*				39	67*				19*					31*											14	33	48
27			53*	56	42*									37*							34*					36	41	58
28	66	69*	38*		12*	34*																				39	41	52
29							29	30*		48*								61								41	77	54
30		53*	41*			48*				53										31*						42	45	58
31	55*	66*					30*		61		56*															42	47	47
32	33*	47				53	38*																			33	43	50
33				63	69							73														22	40	66
34			34*						36*	69										51				53*		59	46	50
35							30*												32*		58		34			38	32	47
36			58*						63											66				56*		69	56	50
37			36*		35				68						32*											28	32	37
38			63*	66							36*		41*						50*							54	53	60
39	34*	37*	51*		52*				33*										35*					32*		41	52	50
40					56	33*										55					52*					42	38	54
41			66*		58				35*		36*					36*										41	66	54
42			64	45									56			32*										42	41	66
43			66*			47*	60			50*				37*												41	42	55
44		54					60		39*									30*								35	36	55
45	61	68				69*			61*																	50	58	76
46	59	74				55*			68*						35*											54	62	66
47	72	72*			35*	53*			34*			30*														66	66	70
48							64	56										50								40	28	36
49	59*	63				36*			69*							54*										55	46	67
50																	60*	67			50*	74				60	53	58
51	51*	48				40*								35*	43*											49	41	42
52						68*		30*						50			30*				48*					35	32	53
53	45*	55				33*	35*		45*																	35	47	68
54	36*	38*							57					47*												43	46	51
55		36*	36*						57*	31*		30*	30*							30*						41	38	58
56							32*	27*	64				68*				32*			36*						44	42	66
57				53	35*							68*		55*	33*											48	48	63
58														60*	63	47	40*									47	56	61
	**	18	12	5	5	7	4	5	6	4	5	3	4	3	4	explained total variance →			3	3	3	2	2	2			

* some loading on more than one factor

** amount of explained variance not rotated

It. No. item number

MT Mourad & Torrance (1979) (n = 666)

STV Straka (1995, in print) (n = 442)

LD Landers (1989) (n = 98)

statistical procedure: principal components analysis & varimax rotation

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Appendix 2:

8-Factor Solutions Of US-Sample, Guglielmino´s Sample And German Sample: 41-Items Form

It.	Factor I			Factor II			Factor III			Factor IV			Factor V			Factor VI			Factor VII			Factor VIII		
no	US	GU	GE	US	GU	GE	US	GU	GE	US	GU	GE	US	GU	GE	US	GU	GE	US	GU	GE	US	GU	GE
1				62			54	45																
2						57	57						33*			40*			33*					
3				54	47*		33*			32*	58													
4	31*		72	70*			45*			32*			35*											
5						54							58									30*		33*
6	33*					39*	53			33*									39*		53			
7										33*	59											47*		
8							51					15	35*									60*		
9				30*	34*		41*					41							33*			48*		
10				36*						63	56													
11						41*	18					51*	64											
12							33*			43*							34*		39*		52			
13			30*	49*		36*				62	36*					35*						41		62
14	18																		49*					
15	32*					31*				33*	40*		47*		12*									
16	63*		66											55		35*								
17				63				39*			31*					54						52*		
18							43*				18*						35*	37*	38*					55*
19										41						63								
20				47*												35*		50*		39*	37*			
21													44											43*
22	17*	41											12*	42*										
23	62	49*	39*											60										
24	15*			16*	31*	19	55*										50*							
25				40*				61		46*						35*		59				12*		
26					67		17*			31*						56		33*						
27			41*											41*			33*		71				38*	
28		49*				33											31*							
29			55	48	18*									12*										
30	61	51*	74							12*														
31	16	66	69												30*			60*				48*	69	
32	14*														74		61							
33							63													57				
34		47*				40				16*														
35							76								66		54							
36									55	50										68				
37								39*					45*								13*	12*		
38		55											33*	31*	37*					36*			45*	
39			19*				40*													35*				
40				54*				48	69														45*	
41				45*			12*	51	47*											68				
	21			16	9		9	8		5	4		4	4		4	3		explained total variance --			48	**	44

"*" items loading on more than one factor

** amount of explained variance not published

It. no. Item number

US US-sample (n = 226)

GUG Guglielmino´s 1977 sample (n = 307)

GER German sample (n = 460)

statistical procedure principal components analysis & varimax rotation

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Appendix 3:

Rater Reevaluation of Guglielmino´s 8-Factor Solution

Item no.	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI	Factor VII	Factor VIII
1		I	IIII	II			III	
2	III		II	III			I	I
3		II	II	I	I			IIII
4	II				IIIII III			
***5	II	IIII		I	I	II		
6		II	IIIII	I		I		I
7		IIII	I	III			II	
8	I	III	II	I				III
9			III	I				IIIII I
10		IIIII III			I			I
11		I	I	I	I	I		IIIII
12	II		IIII	III		I		
13	IIII	I	II	I	I			I
14		II	I	III	I	I		II
15	I	III	II	I				III
16	I			I	IIIII III			
17	I	I	II	II	II		I	I
18		IIII					I	IIIII
19	II			IIIII II	I			
20	I	II	III	III			I	
21	I	II	I	III			II	
22	IIII	I	II	I	I	I		
23	II	II		II	III	I		
24		I	I			IIII		IIII
***25							IIIII IIII	I
26		IIII	IIIII					
27					IIIII III			II
28	I	III	I			III		II
29	IIIII	II			I	I	I	
30		I			IIIII III		I	
31	IIII	IIII			II			
32		IIIII		I	I			III
33		III	III	III		I		
34	I	IIIII	III	I				
35		I				IIIII		IIII
36							IIIII IIIII	
37			IIIII II	I			I	I
38	II	II		I	I	I		II
39		II	IIIII	II		I		
40		IIIII		III		I		I
41	IIIII	I			III		I	

Factor I:	Openness to learning opportunities
Factor II:	Self-concept as an effective learner
Factor III:	Initiative and independence in learning
Factor IV:	Informed acceptance of responsibility for one´s own learning
Factor V:	Love of learning
Factor VI:	Creativity
Factor VII:	Positive orientation to the future
Factor VIII:	Ability to use basic study skills and problem-solving skills
***	Item not included in Guglielmino´s 1977 factor solution
	Guglielmino´s solution (1977)
	Expert solution

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Appendix 4:

Expert-Reevaluation Of Guglielmino´s Definition Of A Highly Self-Directed Learner

Item-No	CHAR I	CHAR II	CHAR III	CHAR IV	CHAR V	CHAR VI	CHAR VII	CHAR VIII	CHAR IX	CHAR X	CHAR XI	CHAR XII	CHAR XIII	CHAR XIV
1	III	V		III	I						II			VI
2	I	IIII	I	III	VIII	I					I	I		
3	II		II	II	VI	I					IIII	II		I
4				II				I		II			XIIII	
***5	VIII	I	I	I		III	I		I	II	II			
6	I	VI		IIII					II	III		I		II
7		IIII		II	II	II		III	I	II				II
8		III	I		I	VI	I	I			IIII		I	I
9	II	IIII			II	I		II	III	II	I	III		II
10				I				I	II	I	XV			
11				I				I		III	III	XI		
12		II		VIII			I		I	II		III	I	
13					VII		III	III		II	II		II	I
14		II		VI	I	I	II	II		V		I		
15	I	I		IIII	I	II		II		IIII	I			I
16			I				VIIII	II		II	I		IIII	
17		I	I		I	I	I			VII		VI	I	I
18	I		I	I	III	I		III	V	I	II		I	I
19		I		VIII		II			I	I	V			
20		IIII	II	VIIII	I			I		I	I			I
21	I	I		II	I		II	II	IIII		V		I	I
22		III	I	I		I	III	II	V	I	I		II	
23	II	I	II	II	I	I		V			I		III	II
24		I		II				I	II	II	III	VII	I	I
***25		I	II									I		XVI
26		V	II			III	II	III	I		III		I	
27	I		II		IIII		V		I		I		VI	
28			II	I	V	III		II	I		I	I	I	II
29	I				I		VIII	IIII					IIII	
30		II	II	II	II	I		I			I		VIIII	
31	IIII	II		I	III		I	III	I	I	I	I	I	
32									XIIII	II	III	I		
33	VI	I	I	IIII				I		I	V			
34				V		III		I			X			
35			I					II	II	V	II	V	I	I
36	I		I	III			III				III		I	VII
37	VIIII	I	I	I		IIII				I	I		I	I
38					XIIIII			I	III					
39	II	III	I			VIII				II		I		II
40	I			I	VII					I	VI		I	II
41	I				I		II	IIII					X	I
SUM	4	4	3	4	6	2	2	1	3	1	3	2	4	3
													Total	39

CHAR	Characteristic
I	Initiative
II	Independence
III	Persistence in learning
IV	Accepting responsibility for one´s own learning
V	View of problems as challenges, not obstacles
VI	Self-discipline
VII	High degree of curiosity
VIII	Strong desire to learn or change
IX	Self-confident
X	Ability to use basic study skills
XI	Ability to organize one´s time and appropriate pace for learning
XII	Ability to develop a plan for completing work
XIII	Joy in learning
XIV	Tendency to be goal oriented
	Deviations from 20 due to missing data
****	Items not included in Guglielmino´s 1977 factor solution
	Expert-solution
	Item assigned to a characteristic by more than 50% of the experts
SUM	Number of items assigned to the characteristic

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Appendix 5:
Lisrel Analyses

		Chi-square	DF	i-square	Chi-squ	GFI	AGFI	RMR
glielmino´s solution (1977), single-structure								
German sample	oblimin							
n=460	orthogonal							
US-sample	oblimin	395,51	182	2,17	0	0,87	0,82	0,066
n=226	orthogonal	412,76	183	2,26	0	0,86	0,81	0,072
glielmino´s solution (1977), multi-structure								
German sample	oblimin	2130,03	654	3,26	0	0,81	0,77	0,071
n=460	orthogonal	2143,72	655	3,27	0	0,81	0,77	0,073
US-sample	oblimin							
n=226	orthogonal	2057,70	655	3,14	0	0,73	0,68	0,082
Model 3: Rater Reevaluation								
German sample	oblimin	1430,93	436	3,28	0	0,84	0,8	0,068
n=460	orthogonal	1512,17	437	3,46	0	0,83	0,8	0,087
US-sample	oblimin							
n=226	orthogonal							
		no solution						

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